

## CLAIMS

1. An enzyme derived from the genus *Empedobacter* or the genus *Sphingobacterium*, and having the ability to produce a peptide from a carboxy component and an amine component.

5

2. An enzyme having the ability to produce a peptide from a carboxy component and an amine component and the ability to produce L-alanyl-L-glutamine at a production rate of 0.03 mM/min or more in a dipeptide-producing reaction under conditions (i) to (iv):

10 (i) the carboxy component is L-alanine methyl ester hydrochloride (100 mM);  
(ii) the amine component is L-glutamine (200 mM);  
(iii) the pH is 9.0; and  
(iv) the amount of enzyme added is less than 0.61 mg/ml as protein

15 amount.

3. The enzyme according to claim 1 or 2, wherein the carboxy component as a substrate includes both the amino acid ester and the amino acid amide.

20

4. The enzyme according to any one of claims 1 to 3, wherein any of an amino acid, a C-protected amino acid and an amine can be used as a substrate for the amine component.

25 5. The enzyme according to any one of claims 1 to 4, wherein the

enzyme has the ability to produce a peptide within a pH range of 6.5 to 10.5.

6. The enzyme according to any one of claims 1 to 5, wherein the  
5 enzyme has the ability to produce a peptide within a temperature range of 0 to 60°C.

7. The enzyme according to any one of claims 1 to 6, wherein the  
enzyme is not inhibited by the serine enzyme inhibitor,  
10 phenylmethylsulfonyl fluoride, but is inhibited by  
p-nitrophenyl-p'-guanidinobenzoate.

8. The enzyme according to any one of claims 1 to 7, wherein the  
enzyme has a molecular weight as determined by SDS-gel  
15 electrophoresis of about 75 kilodalton, and a molecular weight as determined by gel filtration chromatography of about 150 kilodalton.

9. A microbe that produces an enzyme according to any one of  
claims 1 to 8.

20 10. The microbe according to claim 9, wherein the microbe is selected from *Empedobacter brevis* strain FERM BP-8113 and *Sphingobacterium sp.* strain FERM BP-8124.

25 11. A method for producing a dipeptide comprising producing a

dipeptide from a carboxy component and an amine component using an enzyme according to any one of claims 1 to 8 or a substance containing the enzyme.